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**Atty. Doc. No. 2003P14606US**

**REMARKS**

Applicants have amended claims 13 and 14, and canceled claims 19-24. Thus, claims 1-18 are currently pending and presented for examination. Applicants respectfully request reconsideration and allowance of the pending claims in view of the foregoing amendments and the following remarks.

**Confirmation of Election**

Applicant confirms elections of the invention of Group 1, claims 1-18. Consistent with this election, Applicants herein cancel claims 19-24 without prejudice.

**Response to objections to the Specification**

The Examiner objected to the abstract for containing specific references to figures. Applicant has amended the abstract to delete the references to figures. Applicants therefore respectfully request the Examiner to withdraw this objection.

**Response to rejections under Section 112:**

The Examiner rejected claim 14 as being indefinite because the claim references the grains of the second material growing into the second substrate. Applicants have amended claim 14 to recite that the growth is into the first substrate material. Applicants therefore respectfully request the Examiner to withdraw this objection.

**Response to rejections under Section 102:**

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Claims 1, 2, 5 and 10-18 stand rejected under 35 U.S.C. § 102(b), the Examiner contending that these claims are anticipated by Burke (USPN 6,325,871). The Examiner apparently reads Burke as disclosing Applicants' claimed invention. As explained in the Background section of Applicants' disclosure:

*A process that has been used successfully for repair and material addition to components is known by several different names: diffusion brazing; liquid phase diffusion sintering; and transient liquid phase bonding. These names generally refer to a process wherein a consumable material is melted at a temperature that is less than the solidus temperature of a substrate and then is caused to solidify to become integral with the substrate. (A similar process used to join two components without melting is known as solid-state diffusion bonding.) The consumable material may typically include a melting point depressant such as boron, silicon or phosphorous to ensure that the consumable material will melt at a temperature below the melting temperature of the substrate. The work piece and consumable material are held at an elevated temperature for a sufficient interval of time to promote diffusion of the melting point depressant into the substrate material. This diffusion causes the melting temperature of the liquid to increase, resulting in the solidification of the bond line by epitaxial growth of the grains of the substrate. Prior to the onset of solidification, some local melting of the substrate will occur as the melting point depressant diffuses into the substrate. Exemplary applications of such a process to superalloy materials used in gas turbine components are described in United States patents 5,836,075; 6,193,141; and 6,508,000, all of which are incorporated by reference herein.*

Page 1, lines 8-25.

Burke, like the prior art discussed in Applicant's Background section above, and commonly assigned to Applicants' assignee, discloses state of the art transient liquid phase bonding where the melting foil wets the substrate, thereby causing the adjacent base material zone to liquify and dissolve as well as causing foil particles to diffuse into the substrate. See e.g. col. 6 lines 8-34. The inventive aspect of Burke involves a bonding thermal cycle precipitation heat treatment that causes solid state diffusion. See e.g. Burke col. 1 lines 61-67, claim 1. Burke does not teach or suggest cold working the substrate surface to cause the grains to grow into the

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substrate, as claimed by Applicants. Rather, Burke makes a very small well controlled gap by grinding or electrodischarge machining (which the Examiner properly broadly construes as cold working) the substrate surface to prepare the substrate surface for transient liquid phase bonding. Burke col. 11 lines 29-54. Applicants would be glad to provide a Declaration from one skilled in the art to further evidence that Burke does not teach or suggest this claimed grain growth causation feature if the Examiner prefers.

In view of the above, independent claim 1 is patentable. Dependent claims 2 and 5-11 are also patentable at least based on their dependency from claim 1, as well as based on their own merit. Therefore, Applicants respectfully request that the Examiner withdraw the Section 102 rejection.

**Response to Rejections Under Section 103:**

Claims 3 and 7-9 stand rejected under 35 U.S.C. § 103, the Examiner contending that these claims are obvious over Burke in view of obvious design considerations, and Claims 4 and 6 stand rejected under 35 U.S.C. § 103, the Examiner contending that these claims are obvious over Burke in view of Stenard (USPN 5,415,336). The cited references, however, alone or in combination, does not teach or suggest the claimed invention.

As explained in connection with the Section 102 rejection response, claim 1 recites cold working the substrate surface to cause the grains to grow into the substrate.

Regarding claim 4, the Examiner asserts that based on Stenard's teaching of "a range of effective cold working time and rotation of the shot peening device as well as an approximate distance from the surface", that it would have been obvious to one skilled in the art to modify Burke "to have a surface with an uneven pattern of cold working stress in order to induce stress upon the surface without damaging the underlying layers of the substrate making it difficult to

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proceed with diffusion bonding.” Applicants respectfully disagree and respectfully submit that one skilled in the art would not want to use an uneven pattern of cold working stress in Burke because an uneven pattern would induce uneven stress, which is preferentially avoided in transient liquid phase bonding.

Regarding claims 7-9, the Examiner asserts that based on Burke’s teaching “that the bonding temperature should be sufficient to melt the bond foil and a similar thickness of the base material”, that it would have been obvious to one skilled in the art to modify Burke “to cold work the substrate sufficiently to cause the grains to grow into the substrate at least two to four times the thickness of the molten region in order to produce a fine well mixed bond zone.” Applicants respectfully disagree and respectfully submit that one skilled in the art would understand that causing the grains to grow into the substrate would not correlate into the production of a fine well mixed bond zone.

The Examiner is respectfully urged to avoid the insidious temptation of hindsight to conclude that the inventive features taught by Applicants are merely obvious design considerations. Only Applicants’ specification teaches the particularly claimed combination, not the prior art. Applicants respectfully submit that it is improper for the Examiner to rely upon the level of ordinary skill in the art to supply what the Examiner was unable to find – either the claimed combination or a suggestion to modify:

*The level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness. Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment. See W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983) (“To imbue one or ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references or record convey or*

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suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against the teacher.').

*Al-Site Corp. v. VSA Int'l, Inc.*, 174 F.3d 1308, 1324, 50 U.S.P.Q.2d 1161, 1177 (Fed. Cir. 1999) (emphasis added).

This is not one of those rare cases where the level of skill can supply a missing claim limitation or suggestion to modify the prior art.


In view of the above, it is respectfully submitted that claims 3, 4 and 6-9 are patentable at least based on their dependency from claim 1, as well as based on their own merit. Reconsideration and withdrawal of the Section 103 rejection is respectfully requested.

#### Conclusion

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Please grant any extensions of time required to enter this paper. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d) for total independent claims in excess of 3, or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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